TREATMENT OF IRREDUCIBLE INTUSSUSCEPTION DUE TO MECKEL'S DIVERTICULUM

BY

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Intussusception occurring in adolescence as a result of an invaginated Meckel's diverticulum appears to be not uncommon. Hamilton Bailey (1938) says that it is so regularly the cause that a precise pre-operative diagnosis can be made. Harkins (1933), on the other hand, from a statistical study of the literature, concluded that a Meckel's diverticulum accounts for only a small proportion of intussusceptions, while Ladd and Gross (1934), at the Children's Hospital, Boston, found that fourteen out of 372 cases were due to an inverted Meckel's diverticulum. Harkins (1933) found that the great preponderance of cases occur in the first ten years of life, but Romanis and Mitchiner (1937) believe that enteric intussusception is usually seen in children between the ages of 3 and 10; that it is the second commonest variety; and that it is usually due to a Meckel's diverticulum or an intestinal polyp. No age, however, is exempt, and Nédelec (1937) describes a case in a woman aged 52.

Perrin and Lindsay (1921-2) in their analysis of a large series of cases of all types of intussusception found that the enteric variety has much the highest mortality. This type tends to be recurrent or subacute, and in consequence does not reach the surgeon until late. In addition, no difference exists in the calibre of the entering and ensheathing layers, such as is found in the ileo-colic variety. The combination of these two factors renders the enteric intussusception frequently irreducible.

The problem that confronts the surgeon when he opens the abdomen and finds himself face to face with an irreducible intussusception is one which has exercised the minds and ingenuity of many. Where the intussusception is irreducible but not gangrenous Rowlands and Turner (1937) advise restoring the continuity of the canal by a short-circuit anastomosis, and leaving the mass in the abdomen; and they add—referring to infants—that recovery after resection of a gangrenous intussusception is a very rare event. Romanis and Mitchiner (1937), however, say that performance of a short circuit above and below the intussusception, while relieving the obstruction, still leaves the possibility of gangrene occurring with peritonitis. This latter teaching is supported by the figures given by Perrin and Lindsay (1921-2), in whose series the only treatment that was attended by any success was excision with end-to-end or lateral anastomosis. And Clubbe (1921) makes a plea for more frequent excision.

Elliot-Smith (1935) reports three very interesting cases of irreducible intussusception, in which he did a lateral anastomosis and returned the tumour to the abdomen, with or without suturing the neck. All three patients recovered. He says that peritonitis, even in fatal cases untreated by operation, is rare, as the gangrene is limited to the intussusceptum, and the ensheathing layer is usually healthy. Illingworth and Dick (1938) also consider that the vitality of the sheath is seldom imperilled.

The case that is now reported is instructive because it illustrates the danger of leaving behind in the abdomen

an irreducible intussusception, which may at any moment become gangrenous and prove fatal.

Case Report

A girl aged 9 was admitted to hospital as a case of acute appendicitis. There was a history of previous attacks of abdominal pain in the right lower abdomen since she was 6 years of age, occurring at intervals of about six months, each time more severe, and lasting for about two hours or longer. There had never been any vomiting until this last attack, which had begun on the evening of the day before admission. There had been no constipation up to the onset of the pain, but she had not had her bowels open since then, nor had she passed any blood or mucus per rectum. She had never been seen by a doctor during her previous attacks, which had always subsided spontaneously and left her quite well.

On examination she was a well-nourished sturdy child, but somewhat pale. The pulse rate was 116, the temperature 99. While she was being examined she was obviously having spasms of colic, and cried out with the pain. The abdomen was slightly distended, but not rigid. There was a mobile horseshoe-shaped tumour, lying more or less equally on either side of the umbilicus.

Operation.—Under gas-oxygen-ether, the abdomen was opened by a midline subumbilical incision. The intussusception presented at once, and was readily delivered into the wound. It consisted of the terminal portion of the ileum, which had become bent until it occupied three-quarters of a circle, and measured about ten inches in length. The ends of the limbs were quite close together, and extended down to the base of the mesentery. It was quite irreducible. The sheath was healthy and showed no visible signs of gangrene. A lateral anastomosis was performed between the entering and the ensheathing layers an inch or so beyond the extremities of the loop, and the mass was returned to the abdomen. Two days later the pulse and temperature were rising, and the child was having pain. The abdomen was reopened through the original incision. There were patches of gangrene on the sheath of the intussusception. It was withdrawn from the abdomen, and, in manipulating it, the gangrenous areas gave way and spilled foul contents. The whole loop was excised, leaving the anastomosis intact, and the ends were crushed and invaginated.

During the next few days the child passed first a little blood per rectum, and subsequently loose stools. Her condition improved, and, apart from a slight infection of the anterior abdominal wall, she made an uneventful recovery.

DESCRIPTION OF SPECIMEN

The portion of bowel resected was the last twenty inches or so of the ileum. That portion of the bowel which formed the sheath was gangrenous. Within the inner layer, and forming the apex of the intussusception, was a completely invaginated Meckel's diverticulum. It was three inches long, and at first sight was mistaken for an intestinal polyp. In structure it resembled normal small intestine, and was everted without difficulty.

Discussion

This case very clearly proves the danger of leaving behind an intussusception, even though at the time the ensheathing layer appears to be healthy. Such a course may apparently be taken on occasions with impunity, but it seems quite an unjustifiable risk. The extra time needed to excise the tumour and invaginate the ends after the anastomosis has been completed is so small that it cannot materially add to the shock of the operation. If an excision is undertaken it is technically easier and quicker to perform the (lateral) anastomosis before amputating

the tumour, just as, in a partial gastrectomy, it is easier to anastomose the stomach to the jejunum before amputating the stomach.

REFERENCES

- Bailey, Hamilton (1938). *Emergency Surgery*, 3rd ed., London.
 Clubbe, Sir C. P. B. (1921). *Intussusception*, 2nd ed., London.
 Elliot-Smith, A. (1935). *Lancet*, 2, 992.
 Harkins, H. N. (1933). *Ann. Surg.*, 98, 1070. Quoted by Milroy Paul, *British Medical Journal*, 1939, 1, 504.
 Illingworth, C. F. W., and Dick, B. M. (1938). *Surgical Pathology*, 3rd ed., London.
 Ladd, W. E., and Gross, R. E. (1934). *Arch. Surg.*, 29, 365.
 Nédelec, M. (1937). *Mém. Acad. Chir.*, 63, 1331.
 Perrin, W. S., and Lindsay, E. C. (1921-2). *Brit. J. Surg.*, 9, 46.
 Romanis, W. H. C., and Mitchiner, P. H. (1937). *Surgery*, 6th ed., London.
 Rowlands, R. P., and Turner, P. (1937). *Operations of Surgery*, 8th ed., London.

THE DIAGNOSIS AND TREATMENT OF INFANTILE MASTOIDITIS

BY

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In winter a children's hospital contains many cases of severe air-borne infection—influenza, bronchitis, pneumonia, etc. In summer food-borne infection—diarrhoea and vomiting—is more commonly seen. In both summer and winter many bottle-fed infants are admitted. With suitable treatment and feeding a majority of these cases recover without complication. Some patients, however, perhaps after a temporary improvement, begin to go downhill mysteriously, lose weight rapidly, and die. In such cases, although during life the physical signs usually associated with mastoiditis, such as discharge from the ear and swelling behind it, were absent, yet a post-mortem examination has frequently revealed the presence of a purulent mastoiditis on one or both sides. Thus investigation of the records of 146 recent consecutive necropsies revealed that mastoiditis undiagnosed in life had been present on one or both sides in no fewer than twenty-nine cases. It is clear, therefore, that unsuspected mastoiditis is a common and often fatal complication, developing insidiously during the course of the above diseases.

The frequency with which mastoiditis complicates the above diseases has not been sufficiently realized: the reason for its development is to a certain extent shrouded in mystery, and since the physical signs which point to its presence are often masked by those of the disease from which the child is suffering, some confusion exists with regard to the diagnosis.

In order to clarify the problem it is proposed to discuss it under the following headings, pointing out: (1) the extreme frequency of mastoiditis as a complication in the above diseases; (2) the method by which infection gains access to the mastoid antrum and the material which causes it in each disease; (3) the local and general physical signs by means of which diagnosis can be made with confidence; (4) the treatment which experience has shown to be effective; (5) certain nursing details which have been found useful in prevention and helpful in promoting spontaneous recovery.

Frequency

At the Royal Liverpool Children's Hospital during the last six months mastoiditis has been recognized as a complication in thirty-six cases of children suffering from one

or other of the above diseases. All were referred to the laryngologist by the courtesy of the physician or surgeon in charge, and in nearly all of them the classical physical signs usually associated with mastoiditis were absent.

Method of Infection

We must remember that the Eustachian tube is more horizontal in children than in adults, and that normally it opens with each act of deglutition. On account of this horizontal position any material in the post-nasal space finds its way through the Eustachian tube into the tympanum and thence to the mastoid antrum more easily than in adults—especially when the child is lying on his back while feeding. It is thus seen how easily infected mucus can enter the tympanum from the post-nasal space in air-borne disease, and how vomited material may do so in food-borne disease and milk in bottle-fed infants.

Diagnosis

We have seen that diagnosis is often obscured not only by the physical signs of the disease from which the child is suffering but also by the fact that those usually associated with mastoiditis are absent—for example, as a rule there is no discharge from the ear, and swelling behind it is never present at a stage when, in the interest of the child's life, treatment is imperative. Moreover, the child is too young to tell us that he has earache, and palpation over the mastoid process gives us no definite help. Nevertheless experience has shown that mastoiditis can be recognized in these children at an early stage by the presence of local physical signs, other than those usually associated with mastoiditis, in conjunction with considerations in regard to the child's general condition.

GENERAL CONSIDERATIONS

In the first place the child is suffering from an air-borne or food-borne infection or is a wasted bottle-fed infant. We have seen that in these illnesses mastoiditis is a common complication. If, therefore, such a child is not improving, mastoiditis is likely to be the cause and should always be suspected. Further, it may be that for the last two or three days an increase in the temperature has been noted. Perhaps the child has been crying out as if in pain. The nurse may have noticed that he has been putting his hand to his head or pulling at his ear or rolling his head on his pillow. Diarrhoea and vomiting may have increased or, if not present, have now appeared, leading to rapid loss of weight and dehydration.

LOCAL PHYSICAL SIGNS

A discharge from the ear is seldom present, but examination with the electric auroscope may reveal a pool of pus too small to appear outside. Often the tympanic membrane is pink, especially in the upper and posterior quadrant, or it may only show a loss of lustre or a wrinkled appearance like a piece of crushed tissue paper. Frequently nothing abnormal is seen.

There is, however, one physical sign which is constant—one that has not received the attention it deserves. It consists in the presence of a palpable gland or glands in the posterior triangle of the neck behind the sternomastoid muscle. The glands in this region are often easily palpable, but sometimes difficulty is experienced in detecting them, for they are small at first, but increase in size with the chronicity of the mastoid infection. It is therefore to be expected that at an early stage the glands are more difficult to find than at a later date. There are, of course, other conditions which produce enlargement of the glands in the posterior triangle of the neck, such as